YANOVSKIY, B.M.

Activities of the Bureau of Weights and Measures and the All-Union D.I.Mendeleev Scientific Research Institute in establishing and maintaining standards of electric units. Trudy VNIIM no.6:4-27 '49. (MIRA 11:11)

(Electric standards)

1. YANOVSKIY, B. M.

2. USSR (600)

4. Magnetism, Terrestrial

7. Principles of geoelectricity, part 1. Natural and continuous active fields. 1951. Prof. A. P. Kraev. Reviewed by B. M. Yanovskiy. Vest. Len. un. 7, No. 6, 1952.

9. Monthly List of Russian Accessions, Library of Congress, May 1953, Uncl.

YANOVSKIY, B.M.; GORBATSEVICH, S.V.; VOLKOV, N.A.; YUDIN, M.F., kand. tekhn. nauk, otv. red.; ZABORDINA, A.A., tekhn. red.

[Absolute measurements of electric currents] Absoliutnye izmereniia sily toka. Moskva, Gos. energ. izd-vo, 1953. 124 p. (Leningrad. Vsesoiuznyi nauchno-issledovatel'skii institut metrologii. Trudy, no.15). (MIRA 11:5)

1. Direktor Vsesoyuznogo nauchno-issledovatel'skogo instituta metrologii im. D.I. Mendeleyeva (for Yudin).
(Electric currents--Measurements)

YANOVSKIY, B.M.

PHASE X TREASURE ISLAND BIBLIOGRAPHICAL REPORT AID 618 - X

BOOK Call No.: QC815.I3

Author: YANOVSKIY, B. M.
Full Title: TERRESTRIAL MAGNETISM. 2nd. ed., suppl.
Transliterated Title: Zemnoy magnetizm. 2oe. izd., dopoln.

PUBLISHING DATA

Originating Agency: None
Publishing House: State Publishing House of Technical and Theoretical Literature
Date: 1953 No. pp.: 591 No. of copies: 6,000
Editorial Staff:
Contributors: Members of the Institute of Terrestrial Magnetism: N. V. Pushkov, Prof. Yu. D. Kalinin, N. P. Ben'kova, V. P. Orlov, S. I. Isayev and S. M. Mansurov.

PURPOSE AND EVALUATION: Approved as a text and reference book for university students who specialize in geophysics and geology by the Main Administration of Higher Education of the Ministry of Culture, USSR. The book is well planned and well written, with clear and to the point definitions. It seems to be based on the most recent literature (1941-1953) connected with the general questions of terrestrial magnetism, magnetic prospecting and instruments construction. The instruments, mainly of Russian make, and their use are in general

LOGACHEV, Aleksandr Andreyevich; YANOVSKIY, B.M., redaktor; KOLOSKOVA, M.I., redaktor; POPOV, N.D., tekhnicheskiy redaktor; GUROVA, O.A. tekhnicheskiy redaktor.

[Course in magnetic prospecting] Kurs magnitorazvedki. Moskva, Gos. nauchno-tekhn.izd-vo lit-ry po geol. i okhrane nedr, 1955. 301 p. (Prospecting-Geophysical methods) (MLRA 9:1)

USSR/Geophysics - Physics of the earth (book review) FD-2773

Card 1/2 Pub 45 - 12/13

Author : Yanovskiy, B. M., Dr. Phys.-Math. Sci. (reviewer)

Title : Book review. Osnovy fiziki Zemli [Principles of the physics of the Earth], by V. A. Magnitskiy; Geodesic Press, Moscow, 1953, 290 pages

Periodical : Izv. AN SSSR, Ser. geofiz., Sep-Oct 1955, 485-487

Abstract : Fifteen years have passed since the appearance of the last edition of P. N. Tverskiy's Kurs geofiziki [Course of geophysics], in which time many problems in the discipline of the physical processes occurring in the Earth's sphere have obtained new clarification and a whole new series of phenomena employed for practical purposes has been discovered; notions on the structure of the terrestrial sphere differ considerably from the notions of thirty years ago, and new hypotheses on the origin of the solar system, which influence opinions on the Earth's structure, have appeared, especially in connection with the structure of the Earth's mantle or crust, thanks to new methods of its investigation unknown earlier. Existing courses on individual branches of geophysics such as Osnovy seysmologii i seysmometrii [Principles of seismology and seismometry] by Ye. F. Savarenskiy

Abstract : and D. P. Kirnos, Gravimetriya i gravimetricheskaya razvedka [Gravimetry and gravimetric prospecting]by Sorokin, Zemnoy magnetizm [Terrestrial magnetism] by B. M. Yanovskiy cannot be replaced by a general course of geophysics. The reviewed book admitted as a textbook by the Ministry of Higher Education does tend to fill the gaps in Soviet geophysical literature and gives a fuller notion of the Earth's structure.

YANOVSKIY, B.M.

A.N.Boiko's 70th birthday. Izm. tekh. no.2:60 Mr-Ap '55.
(MLRA 8:9)

(Boiko, Alekseĭ Nikitich, 1885--)

YANOVSKIY, B.M.; SOKOLOVA, Ye.A.

Interference devices for measuring the magnetostriction of ferromagnetic substances. Izm.tekh.no.5:20-22 S-O '56. (MLRA 10:2)
(Magnetostriction--Measurement)
(Ferroelectric substances)

YANOVSKIY, B.M.

Systems of units for electric and magnetic values. Izm.tekh. no.6:11-19 N-D '56. (MIRA 10:1)
(Electric units) (Magnetic measurements)

YANOVSKIY, B.M.

ARUTYUNOV, V.O.; GORBATSEVICH, S.V.; ZUBRILIN, V.P.; KOLOSOV, A.K.; ROMANOVA, M.F.; TIKHODEYEV, P.M.; CHERNYSHEV, Ye.T.; SHIROKOV, K.P.; SHRAMKOV, Ye.G.; YANOVSKIY, B.M.

Mikhail Fedoseevich Malikov; on his 75th birthday. Izm. tekh. no.2: 85-86 Mr-Ap '57. (MLRA 10:6)

(Malikov, Mikhail Fedoseevich, 1882-)

YANOVSKIY, B. M.

ARUTYUNOV, V. P.: DOLINSKIY, Ye. F.; KOLOSOV, A. K.; MAKSIMOV, L. M.; ROMANOVA, M. F.; RUDO, N. M.; CHECHURINO, Ye. N.; SHIROKOV, K. P.; SHRAKov, YE. G.; YANOVSKIY, B. M.

E.T. Chernyshev; 50th birthday anniversary and 30th anniversary of scientific and pedagogoc activities. Izm. tekh. no.3:91 My-Je '57 (MLRA)10:8
(Chernyshev, Evgenii Titovich, 1907-)

IVANOVSKIY, B.M.; AMATUNI, N.L.; GORBATSEVICH, S.V.

Reproducing the electric resistance unit by means of calculated mutual inductance and frequency. Trudy VNIIM no.31:32-35 '57. (MIRA 11:11)
(Electric resistance--Standards)

ARUTYUNOV, V. O., GORDOV, A. N., KAYAK, L. K., YANOVSKIY, B. M.

"Neueste Ergebnisse und Richtungen der Entwicklung der Metrologie"

report presented at the
Intl. Measurements Conference (IMEKO) Budapest, 24-30 November ~~1960~~ 1958

YANOVSKIY, B. M.; ALEKSANDROV, V. A.; and PUDOVKIN, M. I.,

"The Magnetic Field of Magnet Disturbances in the Artic and Antarctica,"

paper presented at the Xth General Assembly of the IAU, Moscow, ug 1958.
(CSAGI) 1-9 Aug. 1958

AGALETSKIY, B.M.; YEGOROV, K.N.; MARTSINYAK, A.I.; YANOVSKIY, B.M., prof. red.; ARUTYUNOV, V.O., doktor tekhn.nauk, prof., otvetstvenny red.; MATVEYEVA, A.Ye., tekhn.red.

[Absolute determination of the acceleration of gravity at the All-Union Scientific Research Institute of Metrology.] Absoliutnye opredeleniia uskoreniia sily tiazhesti v punke VNIIM. Moskva, Gos. izd-vo standartov "STANDARTGIZ." 1958. 89 p. (Leningrad. Vsesoiuznyi nauchno-issledovatel'skii institut metrologii. Trudy no.32) (MIRA 11:11)

1. Direktor Vsesoyuznogo nauchno-issledovatel'skogo instituta metrologii im. D.I. Mendeleyeva (for Arutyunov).
(Gravity)

KHRAMOV, Aleksey Nikitich; YANOVSKIY, B.M., red.; BARKOVSKIY, I.V., vedushchiy red.; GENNAD'YEVA, I.M., tekhn.red.

[Paleomagnetic correlation of sedimentary formations] Paleomagnitnaia korreliatsiia osadochnykh tolshch. Leningrad, Gos. nauchn.tekhn.izd-vo neft. i gorno-toplivnoi lit-ry, 1958. 218 p. (Leningrad. Vsesoiuznyi neftianoi nauchno-issledovatel'skii geologo-razvedochnyi institut. Trudy, no.116) (MIRA 11:12)
(Geology, Stratigraphic) (Magnetism, Terrestrial)
(Rocks, Sedimentary)

DOLINSKIY, Ye.F.; AGALETSKIY, P.N.; GAYEVSKIY, N.A; LASSAN, V.L.; OSTROUMOV, B.A.; SMOLICH, S.A.; STEPANOV, L.P.; YANOVSKIY, B.M.

Metrological activities in the field of mechanical measurements. Trudy.VNIIM no.33:39-59 '58. (MIRA 11:11)

1. Rukovoditel' otdela mekhanicheskikh izmereniy Vsesoyuznogo nauchno-issledovatel'skogo instituta metrologii imeni D.I. Mendeleyeva (for Dolinskiy)

(Mensuration)

SHRAMKOV, Ye.G.; GORBATSEVICH, S.V.; KOLOSOV, A.K.; DROTKOV, I.N.; ROZHDESTVENSKAYA, T.B.; SHIROKOV, K.P.; CHERNYSHEV, Ye.T.; YANOVSKIY, B.M.

Metrological activities in the field of electric and magnetic measurements. Trudy.VNIIM no.33:60-93 '58. (MIRA 11:11)

1. Rukovoditel' otdela elektricheskikh i magnitnykh izmereniy Vsesoyuznogo nauchno-issledovatel'skogo instituta metrologii imeni D.I. Mendeleyeva (for Shramkov).
(Electric measurements) (Magnetic measurements)

89778

S/169/61/000/002/033/039
A005/A001

9,9500
3,9100

Translation from: Referativnyy zhurnal, Geofizika, 1961, No. 2, p. 49, # 20339

AUTHORS: Aleksandrov, B. A., Pudovkin, M. I., Yanovskiy, B. M.

TITLE: The Magnetic Field of Magnetic Disturbances in the Arctic and Antarctic Regions

PERIODICAL: V sb.: "Magnitno-ionosfernyye vozmushcheniya", No. 1, Moscow, AN SSSR, 1959, pp. 17-23

TEXT: During 1953-1957, up to five magnetic variational field stations operated simultaneously in the northwestern region of the Asiatic part of the USSR. Their data were used together with data of the arctic and mid-latitude magnetic observatories of the USSR for the presentation of the geomagnetic variation field during magnetic storms by synoptic maps of variation isolines. The analysis of these maps allowd the authors to draw some conclusions on the morphology of the magnetic variation field during storms. The author holds electric currents as the main cause of variations; they formed nearly linear and extended in latitudinal direction over latitudes of about 65°. The comparison of the magnetic and

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89778

S/169/61/000/002/033/039
A005/A001

The Magnetic Field of Magnetic Disturbances in the Arctic and Antarctic Regions

Ionospheric data of the antarctic observatory Mirnyy led to the conclusion that these currents are originated, apparently, by the "dynamo mechanism" in the E_s-layer at its motion in the Earth's constant magnetic field.

V. Afanas'yeva

Translator's note: This is the full translation of the original Russian abstract.

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SOV/115-59-4-15/27

28(5)
AUTHORS: Yanovskiy, B.M., Sokolova, Ye.A., and Gegin, V.S.

TITLE: A Magnetostriction Measuring Device for the Temperature Range from -180 to +440°C (Ustanovka dlya izmereniya magnitostriktsii v intervale temperatur ot -180 go +440°C)

PERIODICAL: Izmeritel'naya tekhnika, 1959, Nr 4, pp 27-30 (USSR)

ABSTRACT: A magnetostriction measuring device for the temperature range from -180 to +440°C was developed and built in the Magnitnaya laboratoriya VNIIM (Laboratory of Magnetism VNIIM). A photograph of this device is shown in figure 1. It consists of a magnetometrical and a magnetostriction part. The magnetometrical part is used for measuring the magnetization J of a specimen and consists of an astatic magnetometer and two magnetizing coils. The astatic magnetometer system is composed of two cylindrical permanent magnets, made of "magniko" alloy. The magnetometer is calibrated in units of the field intensity or in units of the magnetic moment. The error is

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A Magnetostriction Measuring Device for the Temperature Range from -180 to +440°C

± 1% at magnetometer deflections of 300 mm. The magnetostriction part is used for measuring the magnetostriction of the specimen at the given magnetization J. It consists of an interferometer PIU-1 or PIU-2 with a quartz tube for holding the specimen. For increasing the magnetostriction measuring range, the "Fabri-Pero" standard was applied for the first time to an interferometer, whereby the accuracy of the latter was maintained. A thermostat and a cryostat provide the required temperature control. The author presents four graphs and two tables for explaining measuring results with this device. There are 1 photograph, 4 graphs, 2 tables and 1 Soviet reference.

SOV/115-59-2-22/38

AUTHOR: Yanovskiy, B.M., Studentsov, N.V., Tikhomirova, T.N.

TITLE: On Assessing the Importance of the Gyromagnetic Relation of the Proton in a Weak Magnetic Field (K izmereniyu znacheniya giromagnitnogo otnosheniya protona v slabom magnitnom pole)

PERIODICAL: Izmeritel'naya tekhnika, 1959, V. 20 Nr 2, pp 39-40 (USSR)

ABSTRACT: The phenomenon of paramagnetic nuclear resonance is used nowadays to measure magnetic field intensity. Currently, work is in progress in the VNIIM laboratory for magnetic measurements to determine the degree of gyromagnetic relation of the proton in accordance with the method of free nuclear induction. The first efforts in this direction were made according to the Thomas (USA) method and the Wilhelmy (West Germany) method. Similar work is currently being carried out at the Khar'kov State Institute for Measurements and Measuring Equipment, particularly using the Thomas method. There

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SOV/115-59-2-22/38

On Assessing the Importance of the Gyromagnetic Relation of the Proton in a Weak Magnetic Field

are 2 references, 1 of which is English and 1 German.

Card 2/2

ARUTYUNOV, V.O.; KOLOSOV, A.K.; CHERNYSHEV, Ye.T.; SHRAMKOV, Ye.O.; YANOVSKIY, B.M.

A.N.Boiko; obituary. Izm.tekhn. no.8:63 Ag '60. (MIRA 13:9)
(Boiko, Aleksei Nikitich, 1885-1960)

YANOVSKIY, B. M.

S/006/60/000/008/001/001
B012/B051

AUTHOR: None given

TITLE: Chronicle

PERIODICAL: Geodeziya i kartografiya, 1960, No. 8, pp. 72-77

TEXT: From May 10-14, 1960 the shestoye Mezhduvedomstvennoye soveshchaniye po gravimetrii (Sixth Interdepartmental Conference on Gravimetry) was held in Moscow. It was convened by the geodezicheskaya sektsiya Komiteta geodezii i geofiziki Akademii nauk SSSR (Section for Geodesy of the Committee of Geodesy and Geophysics of the Academy of Sciences USSR) and the Aerogravimetricheskaya laboratoriya Instituta fiziki Zemli AN SSSR (Laboratory for Aerogravimetry of the Institute of Physics of the Earth of the AS USSR). 216 representatives of 64 organizations took part in this conference: production organizations, research centers, testing and construction organizations, educational institutions, and organizations of the Akademiya nauk SSSR (Academy of Sciences USSR), Sibirskoye otdeleniye AN SSSR (Siberian Department of the

Card 1/6

AS USSR), Akademii nauk Ukrainskoy, Gruzinskoy, Litovskoy i Azerbaydzhanskoy SSR (Academies of Sciences of the Ukrainskaya, Gruzinskaya, Litovskaya, and Azerbaydzhanskaya SSR), Ministerstvo vysshego i srednego spetsial'nogo obrazovaniya SSSR (Ministry of Higher and Secondary Special Education of the USSR), Ministerstvo geologii i okhrany nedr SSSR (Ministry of Geology and Preservation of Mineral Resources), Komitet standartov, mer i izmeritel'nykh priborov pri Sovete Ministrov SSSR (Committee on Standards, Measures, and Measuring Instruments of the Council of Ministers USSR), NII VTS, Gosudarstvennyy Komitet Soveta Ministrov SSSR po avtomatizatsii i mashinostroyeniyu (State Committee on Automation and Machine Construction of the Council of Ministers USSR), as well as representatives of the factories of the Moskovskiy sovnarkhoz (Moscow Sovnarkhoz) and the Leningradskiy sovnarkhoz (Leningrad Sovnarkhoz) that produce gravimetric apparatus. 70 lectures were held. I. D. Zhongolovich (Institut teoreticheskoy astronomii AN SSSR (Institute of Theoretical Astronomy of the AS USSR) spoke about the "Experience With Determining Some Parameters of the Gravitational Field of the Earth From Observations of the Second and

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Third Artificial Satellites". B. M. Yanovskiy (VNIIM) spoke about "The Determination of the Absolute Value of Gravitational Acceleration of the Point of VNIIM in Leningrad". M. Ye. Kheyfets spoke about the "High-precision Pendulum Apparatus of the TsNIIGAiK", V. A. Tulin about "Portable Quartz Clocks", L. A. Gerenburg about "Questions of Time Recording in Pendulum Measurements", G. M. Mininzon, T. M. Ayrapetyan, and M. S. Davydov about the "Portable Gravimeter-altimeter GBN-1 (GVP-1)", K. Ye. Veselov about the "Design of a High-precision Gravimeter", Yu. D. Bulanzhe (IFZ AN SSSR (IFZ AS USSR)) about "The Main Working Directions in the Field of Determining Gravitational Acceleration on the Sea", V. A. Romanyuk about "The Theory of Determining Gravitational Acceleration on the Sea by Means of Gravimeters", A. M. Lozinskiy about "String Sea Gravimeters". M. S. Molodenskiy (TsNIIGAiK) investigated in his lecture tolerable errors already published in reports or submitted for publication by some authors. Among these are papers by I. F. Monin (L'vovskiy politekhnicheskiy institut (L'vov Polytechnic Institute)), A. K. Malovichko (Permskiy Gosudarstvennyy universitet (Perm' State University)), and S. V. Gromov (Leningradskiy Gosudarstvennyy universitet

(Leningrad State University)). L. A. Govorova spoke about "The Errors of Interpolation of Gravity Anomalies and the Accuracy of Determining Gravimetric Deflections of the Vertical", B. A. Bryusov (MGU) about "Errors of the Representation and Interpolation of Gravitational Anomalies". S. N. Shcheglov reported on "Preliminary Results of Geodetic and Gravimetric Work in the Antarctica", Yu. N. Avsyuk on the "Structure of the Earth Crust in the Antarctica According to Seismo-gravitational Data", S. A. Ushakov on "The Structure of the Earth Crust in the Antarctica According to Gravimetric Data". P. S. Zakatov (MIIGAiK) spoke about the "Preparation and Use of Gravimetric Experts". The recommendations given by the Conference are mentioned. From April 19 to 22, 1960 a Scientific and Technical Conference of the Workers of the Topographic-geodetic and the Surveying Service of the Glavnoye Upravleniye geologii i okhrany nedr pri Sovete Ministrov Ukrainskoy SSR (Main Administration of Geology and Preservation of Mineral Resources of the Council of Ministers Ukrainskaya SSR) was held in Artemovsk. There, the state of the topographic-geodetic and surveying work in the organizations of the Glavgeologiya USSR (Glavgeologiya UkrSSR) and the introduction of new

techniques and technology in production were discussed. At the Conference it was stated that the extent of the work mentioned will be considerably increased within the next seven years. Furthermore, the following drawbacks were pointed out: The methods applied are too extensive and expensive, the geological organizations are insufficiently equipped with new apparatus; in geological observations the aero-photographs and topographic plans available on a large scale are not sufficiently used. This state is explained by inefficient technical direction, inefficient technical and material supply, by a lack of suitable direction in the Glavgeologiya UkrSSR and the Ministerstvo geologii i okhrany nedr SSSR (Ministry of Geology and Preservation of Mineral Resources of the USSR). Recommendations are given to improve this situation. For improving the qualifications of the workers the Conference suggested to convene scientific and technical conferences at regular intervals. For improving information and for the exchange of experience the editorial board of the present periodical was asked to furnish a section for topographic and geodetic work in geological observations. The participants in the Conference appealed to the workers

of the topomarksheyderskaya sluzhba Glavgeologii USSR (Topographic and Surveying Service of the Glavgeologiya UkrSSR) to do everything possible in order to carry out the resolutions of the 21st Party Congress of the CPSU and the Plenum of the Central Committee of the CPSU in June.

STUDENTSOV, N.V.; YANOVSKIY, B.M.

Computing the magnetic field intensity of single-layer Helmholtz coils. Trudy inst. Kom. stand., mer i izm. prib. no.43:22-39 '60. (MIRA 14:7)

(Magnetic measurements)

S/058/61/000/007/055/086
A001/A101

24.2200

AUTHORS: Studentsov, N.V., Tikhomirova, T.N., Yanovskiy, B.M.

TITLE: The application of magnetic nuclear resonance to measuring the constants of coils in magnetic fields

PERIODICAL: Referativnyy zhurnal. Fizika, no. 7, 1961, 283, abstract 7E478 ("Tr. in-tov Kom-ta standartov, mer i izmerit. priborov pri Sov. Min. SSSR", 1960, no. 43 (103), 43 - 51)

TEXT: The authors consider the method of measuring the constants of the coils in the wide range of their values, based on the phenomenon of nuclear magnetic resonance absorption and free nuclear induction. The results of measuring the constants of the coils in magnetic fields of 50 and 0.5 oe intensities are presented.

[Abstracter's note: Complete translation]

B

Card 1/1

S/194/61/000/011/004/070
D256/D302

3,9110

AUTHORS: Studenosov, N.V., Tikhomirova, T.N. and Yanovskiy, B.M.

TITLE: Measuring the components of the Earth's magnetic field by a nuclear resonance method

PERIODICAL: Referativnyy zhurnal. Avtomatika i radioelektronika, no. 11, 1961, 5, abstract 11 A35 (Tr. in-tov Kom-ta standartov, mer i izmerit. priborov pri Sov. Min. SSSR, 1960, no. 43 (103), 52-55)

TEXT: A method is described of measuring the Earth's magnetism by employing the phenomenon of free nuclear resonance and compensating one of the components of the geo-magnetic field vector. The short comings of the classical Gauss method are considered, and the proposed method of measuring the vertical and horizontal components of the Earth's magnetic field is briefly described. The arrangement of the instrument is presented and the factors determining the

Card 1/2

Measuring the components...

obtainable accuracy are considered. An accuracy of 0.005% was achieved in preliminary measurements with the described method.
[Abstracter's note: Complete translation]

Card 2/2

KHRAMOV, A.N.; PETROVA, G.N.; KOMAROV, A.G.; KOCHEGURA, V.V.;
Prinimali uchastiye: DIAKOV-KLOKOV, V.I.; PIONTKOVSKIY,
S.S.; YANOVSKIY, B.M., nauchnyy red.; RUSAKOVA, L.Ya.,
vedushchiy red.; GENNAD'YEVA, I.M., tekhn.red

[Methodology of paleomagnetic investigations] Metodika paleomagnitnykh issledovanii. Leningrad, Gos. nauchn.-tekhn.izd-vo neft. i gorno-toplivnoi lit-ry. Leningr. otd-nie, 1961. 130 p. (Leningrad. Vsesoiuznyi neftianoi nauchno-issledovatel'skii geologorazvedochnyi institut. Trudy, no.161) (MIRA 14:7)

1. Vsesoyuznyy neftyanoy nauchno-issledovatel'skiy geologorazvedochnyy institut (for Khramov). 2. Moskovskiy gosudarstvennyy universitet (for Petrova). 3. Vsesoyuznyy nauchno-issledovatel'skiy geologicheskiy institut (for Komarov, Kochegura). 4. Institut elementorganicheskikh soyedineniy (for Dianova-Klokova). 5. Institut fiziki Zemli AN SSSR (for Piontkovskiy). 6. Leningradskiy universitet (for Yanovskiy).
(Magnetism, Terrestrial)

S/263/62/000/010/011/013
I028/I250

AUTHOR: Studentsov, N. V. and Yanovskiy, B. M.

TITLE: Absolute determinations of the gyromagnetic proton ratio in a weak magnetic field

PERIODICAL: Referativnyy zhurnal, otdel'nyy vypusk. 32. Izmeritel'naya tekhnika, no. 10, 1962, 57, abstract 32.10.415. "Tr. in-tov Kom-ta standartov, mer i izmerit. priborov pri Sov. Min. SSSR", 1961, no. 54 (114), 3-36

TEXT: A method is described for determining the magnetic field strength as one of the basic units for a new system of units based on natural standards. In this system the wave length of a light wave is the length unit and the time unit — the frequency of oscillations of molecules in the infra-red region, measured with an accuracy of up to 10^{-8}. Using the discovery of paramagnetic nuclear resonance, permitting the measurement of the magnetic field strength with a relative error of about 10^{-6} utilising the ratio of the magnetic moment of the proton to its mechanical moment (atomic constant — gyromagnetic ratio), one can write the dependence of the frequency on the magnetic field strength in the form

$$2\pi f = (\gamma + \alpha)H$$

where γ = the gyromagnetic ratio, α = a coefficient expressing the connection between the nucleus and its

Card 1/2

external shell. For the detection of the nuclear paramagnetic resonance it is sufficient to place a substance with precessing nuclei in a receiving coil in which an emf is induced. The frequency can be ascertained by the method of free nuclear induction. The method of nuclear magnetic resonance permits the measurement of only the total vector of the magnetic field strength. A method is therefore necessary that would eliminate the magnetic field of the earth. Such a method is measurement with the aid of Helmholtz rings. A detailed exposition of the theory of sources of a homogeneous magnetic field and description of the various equipment used in the application of this theory to the measurement of a magnetic field are given, together with the experimental data on the determination of the gyromagnetic ratio of the proton. There are 14 references.

[Abstracter's note: Complete translation.]

44257

S/035/62/000/012/055/064
A001/A101

9.6160

AUTHOR: Yanovsky, B. M.

TITLE: Absolute gravity determinations at the VNIIM station (Leningrad)

PERIODICAL: Referativnyy zhurnal, Astronomiya i Geodeziya, no. 12, 1962, 31, abstract 12G196 ("Freiberger Forschungsh.", 1961, C, no. 100, 53 - 55, German)

TEXT: The author presents results of absolute determinations of gravity at the All-Union Scientific Research Institute of Metrology imeni Mendeleyev (VNIIM) performed in 1956 - 1959 by three different methods. Measurements with five quartz turnable pendulums of different length (40, 60 and 75 cm) yielded the average value of $g = 981.919 \pm 0.0004$ cm/sec^2; measurements by the method of free fall of a quartz rod in vacuum yielded $g = 981.9229 \pm 0.0013$ cm/sec^2, and the combined method (free and restricted fall) - 981.922 ± 0.0016 cm/sec^2. The analysis of errors in results obtained warrants a conclusion that systematic errors of observations do not exist. The average of determinations by three methods, $g = 981.919 \pm 0.003$ cm/sec^2 was adopted as the final value of gravity at the VNIIM station.

[Abstracter's note: Complete translation]

G. Razbegayeva

Card 1/1

LOGACHEV, Aleksandr Andreyevich; YANOVSKIY, B.M., doktor fiziko-matem. nauk, prof., retsenzent; REYKHERT, L.A., ved. red.; SAFRONOVA, I.M., tekhn. red.

[Course in magnetic prospecting]Kurs magnitorazvedki. Izd.2., ispr. i dop. Leningrad, Gostoptekhizdat, 1962. 360 p. (MIRA 15:12)

(Magnetic prospecting)

24.6610

S/115/62/000/006/004/005
E032/E314

AUTHORS: Yanovskiy, B.M. and Studentsov, N.V.

TITLE: Determination of the proton gyromagnetic ratio by the method of free nuclear induction

PERIODICAL: Izmeritel'naya tekhnika, no. 6, 1962, 28 - 31

TEXT: The method used to determine the proton gyromagnetic ratio at VNIIM was described in previous papers of the authors and T.N. Tikhomirova (Izmeritel'naya tekhnika, no. 2, 1959 and Trudy institutov Komiteta standartov, mer i izmeritel'nykh priborov, 1961, v. 54 (114)). The work described in these papers has been continued in order to improve the reliability of the resulting value of this ratio. The present paper gives a brief account of the methods and results for 1958-1961. The basic idea of the experiment is illustrated by Fig. 1, in which 1 is the probe coil containing the distilled-water ampule, 2 is the magnetizing coil, 3 are Helmholz coils, 4 is an amplifier and 5 frequency meter. A brief description is given of the Helmholz coils, the amplifier and the frequency meter. It is pointed out that one of the main errors is due to the

Card 1/2

Determination of ....

S/115/62/000/006/004/005
E032/E314

variation in the Earth's magnetic field and variable magnetic fields of other origin. These variations were automatically compensated in the present apparatus with the aid of a device which was very similar to that described by L.K. Zhukovskaya and N.G. Chernysheva (Trudy institutov Komiteta standartov, mer i izmeritel'nykh priborov, 1960, v. 43, 103). The basic circuit of this device is reproduced. The final result is quoted as $\gamma = (267506 \pm 6) \times 10^3$ $wb^{-1}m^2sec^{-1}$. There are 4 figures and 2 tables.

Card 2/2

YANOVSKIY, B.M.; SHOLPO, L.Ye.; GORSHKOV, E.S.

Some characteristics of viscous magnetization. Izv. AN SSSR. Ser. geofiz. no.6:719-725 Je '62. (MIRA 15:6)

1. Leningradskiy gosudarstvennyy universitet im. A.A. Zhdanova.
(Magnetism, Terrestrial)

LOMANYY, V.D.; PROKOF'YEV, A.G.; YANOVSKIY, B.M.

Using the proton resonance method to measure the components of the earth's magnetic pole. Uch.zap.LGU no.303:3-15 '62. (MIRA 15:11)
(Magnetism, Terrestrial)

SHOLPO, L.Ye.; YANOVSKIY, B.M.

Stability of residual magnetization. Uch.zap.LGU no.303:16-37 '62.
(MIRA 15:11)
(Rocks--Magnetic properties)

YANOVSKIY, B.M., otv. red.; SMIRNOVA, M.Ye., red.; KISELEVA, L.I., tekhn. red.

[Electromagnetic sounding and magnetotelluric methods of prospecting] Elektromagnitnoe zondirovanie i magnitotelluricheskie metody razvedki; materialy Vsesoiuznoi konferentsii, aprel' 1961 g. Leningrad, 1963. 199 p. (MIRA 16:10)

1. Leningrad. Universitet.
(Electromagnetic prospecting)

AM1038591 BOOK EXPLOITATION S/

YAnovskiy, Boris Mikhaylovich

Theoretical principles in the magnetometric method of exploring the earth's crust and geomagnetic measurements. v. 2: The earth's magnetism (Teoreticheskiye osnovy* magnitometricheskogo metoda issledovaniya zemnoy kory* i geomangitny*ye izmereniya. [t.] 2: Zemnoy magnetizm), Leningrad, Izd-vo Leningr. univ., 1963, 461 p. illus., biblio., index. Errata slip inserted. 3,100 copies printed. University textbook.

TOPIC TAGS: geophysics, geology, geomagnetism, magnetic anomaly, geomagnetic prospecting, ferromagnetism, geomagnetic measurement

PURPOSE AND COVERAGE: This text contains the theoretical principles of magnetic prospecting and methods of measuring elements of the Earth's magnetism which are its foundation. Besides, there is a consideration of a number of problems of a secondary nature: magnetic properties of strata, magnetic fields of bodies of varying shape, methods of interpreting magnetic anomalies, etc. The textbook is intended for students, graduate students, and researchers in geophysics.

Card 1/3

YANOVSKIY, Boris Mikhaylovich; Prinyal uchastiye BRYUNELLI, B.Ye., dots.; TSAR'KOVA, Z.I., red.

[Terrestrial magnetism] Zemnoi magnetizm. Leningrad, Izd-vo Leningr. univ. Vol.1. [Morphology and theory of the earth's magnetic field and its variations] Morfologiia i teoriia magnitnogo polia Zemli i ego variatsii. 1964. 445 p. (MIRA 17:8)

1. Kafedra fiziki zemnoy kory Leningradskogo gosudarstvennogo universiteta (for Bryunelli).

RASPOPOV, O. M.; YANOVSKIY, B. M.

Field of the vertical gradient of the Z-component of the geomagnetic field over the northwestern wing of the East Asian anomaly. Izv. AN SSSR.Ser.geofiz. no. 4:548-551 Ap '64. (MIRA 17:5)

1. Leningradskiy gosudarstvennyy universitet im. A. A. Zhdanova.

YANOVSKIY, B.M.; BRYUNELLI, B.Ye.; KOVTUN, A.A.; KUZNETSOV, N.S.; RASPOPOV, O.M.; CHICHERINA, N.D.

Magnetotelluric sounding in the Central Russian Depression. Izv. AN SSSR. Ser. geofiz. no.7:999-1006 Jl '64. (MIRA 17:7)

1. Leningradskiy gosudarstvennyy universitet imeni Zhdanova.

BRYUNETTI, B.Ye.; KOVTUN, A.A.; KUZNETSOV, N.S.; RASPOPOV, O.M.; CHICHERINA, N.D.; YANOVSKIY, B.M.

Studying the structure of the Central Russian Depression by the magnetotelluric method. Uch. zap. LGU no.324:3-16 '64
(MIRA 18:4)

KRAYEV, Aleksandr Pavlovich; YANOVSKIY, B.M., nauchn. red.;
NEVEL'SHTEYN, V.I., ved. red.

[Fundamentals of geoelectricity] Osnovy geoelektriki. Izd.2.,
ispr. i dop. Leningrad, Nedra, 1965. 587 p. (MIRA 18:5)

L 42785-66 EWT(m)/T JXT(CZ)

ACC NR: AR6017186 SOURCE CODE: UR/0058/65/000/012/A028/A028

52
0

AUTHOR: Yanovskiy, B. M.

ORG: none

TITLE: Studies at the VNIIM [All-Union Scientific Research Institute of Metrology] for developing standard absolute electric units

SOURCE: Ref. zh. Fizika, Abs. 12A283

REF SOURCE: Tr. in-tov Gos. kom-ta standartov, mer i izmerit. priborov SSSR, vyp.76(136), 1965, 51-64

TOPIC TAGS: electric current, electric resistance, electric measuring instrument, proton, electric measurement, metrology

ABSTRACT: A description is given of a current balance for the absolute measurement of current (reproduction of a standard ampere); an apparatus for the absolute measurement of resistance (reproduction of a standard ohm); and an apparatus for the absolute determination of the gyromagnetic ratio of a proton. L. Ivanova. [Translation of abstract] [NT]

SUB CODE: 20/05,09/~~SUBM DATE: none/ ORIG REF: none/ SOV REF: none/ OTH REF: none~~/

Card 1/1

YANOVSKIY, B.N.

Yanovskiy, B.N. "On plasma cells", Vracheb. delo, 1949, No. 1, paragraphs 35-40.

SO: U-3042; 11 March 53, (Letopis 'nykh Statey, No. 9, 1949)

YANOVSKIY, B.N., kand.med.nauk, podpolkovnik meditsinskoy sluzhby; KURYLEV, V.V., kapitan meditsinskoy sluzhby

Use of hypnosis in treating neuroses. Voen.-med.zhur. no.7:75 Jl '59. (MIRA 12:11)
(HYPNOTISM--THERAPEUTIC USE)
(NEUROSES)

1. YANOVSKIY, D. M.

2. USSR (600)

4. Snow

7. New snow plough. Sov. agron. 11, no. 1, 1953.

9. Monthly List of Russian Accessions, Library of Congress, March 1953. Unclassified.

YANOVSKIY, D. M.

Yanovskiy, D. M.

"Increasing the Germination and Viability of the Seeds of Perennial and Annual Grasses in the Arid Zone of the Southeast." All-Union Order of Lenin Agricultural Academy imeni V. I. Lenin. Sci Res Inst of Fertilization, Agricultural Engineering, and Soil Science. Moscow, 1955 (Dissertation for the degree of Candidate in Agricultural Sciences)

SO: Knizhnaya letopis' No. 27, 2 July 1955

SOV/20-121-4-20/54

AUTHORS: Berlin, A. A., Stupen', L. V., Fedoseyeva, B. I., Yanovskiy, D. M.

TITLE: An Investigation of the Initiated Copolymerization of Vinyl Chloride With Derivatives of the Methacryl Series (Issledovaniye privitoy sopolimerizatsii vinilkhlorida s proizvodnymi metakrilovogo ryada)

PERIODICAL: Doklady Akademii nauk SSSR, 1958, Vol. 121, Nr 4, pp. 644 - 647 (USSR)

ABSTRACT: If a monomer is polymerized in the presence of polymeric substances it is often subjected to the influence of the radicals of growing chains or of the initiator. In this connection it is possible that as a result of chain transfer active centers are formed on the macromolecules. These centers are able to initiate the polymerization of the monomer resulting in the formation of compounds of high molecular weight with a racemic or threedimensional structure. In case that the side ramifications are of different chemical nature than the main chain, inoculated copolymers form. They combine the properties of the polymers used for the reaction

Card 1/4

(Refs 1-6). This paper gives experimental results on synthesis and investigation of the inoculated polymers which are formed by the polymerization of vinyl chloride in the latex of the copolymer of butyl methacrylate and methacrylic acid (henceforth both referred to as BMA). Further results are mentioned of those polymers forming by the polymerization of a butyl methacrylate- and methacrylic acid mixture in the polyvinyl chloride (PVCh) latex. As table 1 shows the Khaggins constants are higher in the case of inoculated polymers than in the case of linear control polymers. This fact points to a ramification due to the formation of side chains. The mentioned constants of the PVCh- and BMA mixtures are between the constants of individual polymers and are close to the additive values. More than 60% of the monomer erters the reaction with the polymer (coefficient f). Furthermore the polymer solutions were turbodimetrically titrated in dioxane or in a mixture of dimethyl formamide with acetone. Figure 1 shows that a separate precipitation takes place when a mixture of polymers is titrated, whereas the curve of precipitation of polymerizate sample of vinylchloride

in the BMA latex refers to the existence of an inoculated copolymer. Table 2 shows that the increase of the amount of vinylchloride in the mixture of components elevates the yield-(utilization)coefficient f. The addition of a regulator (CCl_4, CHJ_3) abruptly reduces the yield of the inoculated copolymer in consequence of the inactivation of a part of the macroradicals. At the end thermochemical properties and further details of production are mentioned. There are 4 figures, 2 tables, and 8 references, 6 of which are Soviet.

PRESENTED: April 3, 1958, by N.N.Semenov, Member, Academy of Sciences, USSR

SUBMITTED: April 1, 1958

5(3), 15(9) SOV/80-32-4-28/47

AUTHORS: Berlin, A.A., Zil'berman, Ye.N., Rybakova, N.A., Sharetskiy, A.M. and Yanovskiy, D.M.

TITLE: Investigation of Some Epoxide Stabilizers for Polyvinylchloride (Issledovaniye nekotorykh epoksidnykh stabilizatorov polivinilkhlorida)

PERIODICAL: Zhurnal prikladnoy khimii, 1959, Vol 32, Nr 4, pp 863-868 (USSR)

ABSTRACT: One of the most important properties of chlorine-containing polymers is their low resistance to the effects of heat and light. Various stabilizers have been proposed for increasing their thermal resistance. The present article furnishes comparative data on the stabilizing effect of some commercial and newly synthesized (by the authors) compounds. The following stabilizers for polyvinylchloride have been synthesized and tested: low-molecular epoxide resins on the base of epichlorohydrin and 2,2-bis(4-oxy-3-methylphenyl)-propane, 1,1-bis-(4-oxyphenyl)-cyclohexane, 1,1-bis-(4-oxy-3-methylphenyl)-cyclohexane and 2,2-bis-(4-oxy-3-nitrophenyl)-propane; cis-9,10-epoxybutyl stearate, epoxidized castor oil and sperm oil. It has been shown that these compounds, with exception

Card 1/2

Investigation of Some Epoxide Stabilizers for Polyvinylchloride

of 2,2-bis-(4-oxy-3-nitrophenyl)-propane are effective thermostabilizers for polyvinylchloride, which improve also physicomechanical properties of the masticated rubber. The application of mixtures of low-molecular epoxide resins or epoxidized triglycerides with lead silicate makes it possible to attain a greater thermal resistance of polyvinylchloride and a better quality of the masticated rubber, than the separate application of those stabilizers.
There are 2 graphs, 2 tables and 10 references, 1 of which is Soviet, 5 English, 2 American and 2 German.

SUBMITTED: September 20, 1957

YANOVSKIY, D.M.

PHASE I BOOK EXPLOITATION SOV/4984

International symposium on macromolecular chemistry. Moscow, 1960.

Mezhdunarodnyy simpozium po makromolekulyarnoy khimii SSSR, Moskva, 14-18 iyunya 1960 g.; doklady i avtoreferaty. Sektsiya III. (International Symposium on Macromolecular Chemistry Held in Moscow, June 14-18, 1960; Papers and Summaries) Section III. [Moscow, Izd-vo AN SSSR, 1960] 469 p. 55,000 copies printed.

Tech. Ed.: P. S. Kashina.

Sponsoring Agency: The International Union of Pure and Applied Chemistry. Commission on Macromolecular Chemistry.

PURPOSE: This book is intended for chemists interested in polymerization reactions and the synthesis of high molecular compounds.

COVERAGE: This is Section III of a multivolume work containing papers on macromolecular chemistry. The articles in general deal with the kinetics of polymerization reactions, the synthesis of special-purpose polymers, e.g., ion exchange resins, semiconductor materials, etc., methods of catalyzing polymerization reactions, properties and chemical interactions of high molecular materials, and the effects of various factors on polymerization and the degradation of high molecular compounds. No personalities are mentioned. References given follow the articles.

5.3830

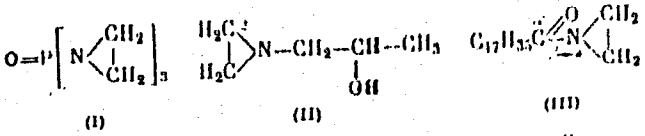
77524
SOV/80-33-1-33/49

AUTHORS: Popova, Z. V., Yanovskiy, D. M.

TITLE: Testing of Some Ethyleneimine Derivatives as Stabilizers of Poly (Vinyl Chloride)

PERIODICAL: Zhurnal prikladnoy khimii, 1960, Vol 33, Nr 1, pp 186-190 (USSR)

ABSTRACT: Stabilizing action of triethylenetriamide of phosphoric acid (I), n-(2-hydroxypropyl)-ethyleneimine (II) and ethyleneamide of stearic acid (III) on poly (vinyl chloride) was studied.



(I) (II) (III)

Poly(vinyl chloride) (PVKh) of trade mark "PF-special" in form of powder and plastics was used. The following determinations were made: decomposition temperature (by heating the sample until liberation of

Card 1/5

HCl, which is indicated by turbidity of $AgNO_3$ solution; thermal stability; and photostability. The latter was determined by the decrease in thermal stability after ultraviolet irradiation and also by a method worked out by the authors. The method is based on the comparison of the rates of HCl evolution on heating the stabilized and nonstabilized samples before and after ultraviolet irradiation. Determinations were made of the ratio of mean integral rates of HCl evolution at 175° in an airflow for 180 minutes for the nonstabilized samples before (v_1) and after (v_2) ultraviolet irradiation, and for the stabilized samples before (v_3) and after (v_4) ultraviolet irradiation.

$\frac{v_3}{v_1} \times 100\%$ characterizes the effect of the stabilizer on the PVKh decomposition after the irradiation. PRK-2 lamp was used.

Testing of Some Ethyleneimine Derivatives as Stabilizers of Poly (Vinyl Chloride)

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SOV/80-33-1-33/49

(a)	(b) (c)	(b) (d)	(e)	(f)	(g)	(h)	i
(j)	0.00025	0.0432	183	0 4	20 4	— —	≫100 ≫100
(k)	0.00025	0.025	180	0 4	9 2	7.3 11.4	170 145
(l)	0.00025	0.0772	179	0 4	13 3	7.1 15.5	165 196
(m)	0.00025	0.0746	183	0 4	14 2	3.2 6.0	75 77
	—	—	168	0 4	7 1.5	4.3 7.9	— —

Card 4/5

Testing of Some Ethyleneimine Derivatives as Stabilizers of Poly (Vinyl Chloride)

77524
SOV/80-33-1-33/45

The data obtained indicate that I, II, and III have a distinct stabilizing effect on PVKh. I, II, and III increase the rate of HCl evolution after the end of the induction period of heating the polymer. I, II, and III can be used as additives which intensify the action of other stabilizers. There is 1 table; 2 figures; and 10 references, 3 U.S., 2 U.K., 1 Italian, 3 German, 1 Japanese. The U.S. and U.K. references are: V. Smoth, Brit. Plast., 27, 307 (1954); B. Henderson, Canadian Plastics, Nov. 66 (1957); G. H. Taft, Plast Mod., May, 170 (1957); L. N. Wartman, Ind. Eng. Chem., 47, 1013 (1955); A. L. Wilson, Am. Pat. 2475068, 5 VII 1949.

SUBMITTED: April 16, 1959

Card 5/5

Testing of Some Ethyleneimine Derivatives as Stabilizers of Poly (Vinyl Chloride)

77524
SOV/80-33-1-33/49

Table 1. Stabilizing action of ethyleneimine derivatives and expoxystearic acid (tested in powder state): Key to Table 1: (a) stabilizer; (b) quantity of stabilizer on 10 g of PVKh; (c) in mole; (d) in g; (e) temperature of decomposition (in ^{o} C); (f) time of irradiation (in hours); (g) thermal stability at 175^{o} (in minutes); (h) mean integral rate of HCl evolution in 3 hours at 175^{o} ($\frac{mg\ HCl}{1\ g PVKh}$); (i) ratio of the rates of HCl evolution on heating the stabilized and non-stabilized polymer (in %); (j) triethylenetriamide of phosphoric acid; (k) N-(2-hydroxypropyl)-ethyleneimine; (l) ethyleneamide of stearic acid; (m) epoxystearic acid; (n) PVKh without stabilizer.

Caption to Table 1, above. See Card 4/5 for Table.

Card 3/5

81605

S/190/60/002/02/04/011
B004/B061

5.3831

AUTHORS: Popova, Z. V., Yanovskiy, D. M.

TITLE: Stabilization of Polyvinylchloride by Products of the Self-condensation of Cyclohexanone

PERIODICAL: Vysokomolekulyarnyye soyedineniya, 1960, Vol. 2, No. 2, pp. 210-215

TEXT: The authors examined the stabilizing effect of the following self-condensation products of cyclohexanone: 1,2,3,4,5,6,7,8,9,10,11,12--dodecahydrotriphenylene (I); 2-[2-(Δ'-cyclohexenyl)-cyclohexylidene]--cyclohexanone (II), and a condensation product from six molecules of cyclohexanone with a molecular weight of 500 - 550 (III), whose structure was not determined. For comparison, the stabilizing effect of 2-cyclohexylidene cyclohexanone (IV), 2,4-dihydroxybenzophenone (V), 2,4,6-trihydroxybenzophenone (VI), 2,4-dihydroxyacetophenone (VII), and resorcinol dibenzoate (VIII) was tested. The effect of these stabilizers was examined on "ПФ (PF) Special" polyvinylchloride (PVC) as powder or

Card 1/3

81605

Stabilization of Polyvinylchloride by Products of the Self-condensation of Cyclohexanone

S/190/60/002/02/04/011
B004/B061

plasticized with ED-242. PVC was decomposed in air at 175°C. The duration of the induction period up to the beginning of HCl separation and the ratio $v/v_0 \cdot 100\%$ (v = quantity of HCl resulting from stabilized PVC, v_0 = quantity of HCl resulting from nonstabilized PVC) were determined. The stabilization against light effect was tested with a ПРК-2 (PRK-2) lamp. Table 1 gives the stabilizing effect of the reagents used, with additions of from 0.00025 M to 10 g of PVC. Fig. 1 shows the inhibiting effect of I, II, and III on the thermochemical decomposition of PVC, and Fig. 2, the dependence of the activity of I, II, and III on the concentration and temperature. It follows from Table 2 that the activity of I, II, and III is not changed by treatment with HCl for ten hours at 175°C, nor by irradiation with a PRK-2 lamp for the same period. These compounds absorbed no chlorine. Tables 3 and 4 give the activity of I, II, III, and IV mixed with lead silicate and calcium stearate in powdered and plasticized PVC. The compounds I, II, and III inhibit the thermal decomposition of PVC, and its decomposition by light. Too high a concentration of these inhibitors can, however, accelerate the

Card 2/3

81605

Stabilization of Polyvinylchloride by Products of the Self-condensation of Cyclohexanone

S/190/60/002/02/04/011
B004/B061

decomposition of PVC, especially at 190 - 200°C. A synergetic effect was observed with I, II, and III in mixtures with lead silicate and calcium stearate. There are 2 figures, 4 tables, and 7 references: 3 Soviet, 1 British, 2 US, and 1 French.

SUBMITTED: August 12, 1959

Card 3/3

15.9220 11.8000

80103
S/080/60/033/04/21/045

AUTHORS: Berlin, A.A., Popova, Z.V., Yanovskiy, D.M.

TITLE: The Stabilization of Polyvinylchloride by Tin-Organic Compounds. Communication 4.

PERIODICAL: Zhurnal prikladnoy khimii, 1960, Vol 33, Nr 4, pp 871 - 877

TEXT: The following products were studied as stabilizers and inhibitors of the thermal destruction of polyvinylchloride (PVC): the condensation products of dibutyl-tin with butyl, amyl and octyl alcohols and tin-organic compounds of the general formula $(C_4H_9)_2SnX_2$, where X is an acyl radical containing or not containing sulfide or epoxide groups. The stabilizing effect was tested on PVC of the "PF-Special" type. It has been shown that in the presence of the substances mentioned the decomposition temperature of PVC increases, as well as the duration of the induction period. The rate of hydrogen chloride liberation decreases during heating of the polymer. Tin-organic stabilizers are inhibitors of PVC decomposition. The inhibiting action is most clearly evident in dibutyl-tin dioctylmercaptide. The stabilizing action of tin-organic compounds practically does not depend on the number of carbon atoms in the alkoxy- and acid groups. The efficiency of the action is considerably intensified if an oxygen atom

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80103
S/080/60/033/04/21/045

The Stabilization of Polyvinylchloride by Tin-Organic Compounds. Communication 4.

in the alkoxy-group is substituted by a sulfur atom. This can be explained by the combination of the properties of antioxidant and dehydrochlorination inhibitor in the sulfur-containing tin-organic compounds. The behavior of tin-organic compounds as acceptors of hydrogen chloride differs sharply from the behavior of typical accepting stabilizers. In the case of heating PVC in the presence of tin-organic compounds, the concentration of ionic chlorine present in the polymer decreases due to the binding of hydrogen chloride by the stabilizer. The application of tin-organic compounds in a mixture with antioxidants, as well as the application of ternary mixtures containing a tin-organic stabilizer, an antioxidant and a typical acceptor of hydrogen chloride, leads to a considerable intensification of the stabilizing action. N.A. Rybakova, N.K. Taykova and Ye.N. Zil'berman are mentioned as suppliers of the tin-organic materials.
There are: 3 tables, 3 graphs and 12 references, 4 of which are Soviet, 5 American, 1 English, 1 German and 1 French.

ASSOCIATION: Filial Nauchno-issledovatel'skogo instituta Goskomiteta po khimii (Branch of the Scientific Research Institute of the State Committee for Chemistry)

SUBMITTED: August 4, 1959

Card 2/2

BERLIN, A.A.; KRONMAN, A.G.; YANOVSKIY, D.M.; KARGIN, V.A.

Modification of polyvinyl chloride by rubbers. Vysokom. soed. 2 no.8:1188-1192 Ag '60. (MIRA 13:9)
(Ethylene) (Rubber)

BERLIN, A.A.; STUPEN', L.V.; FEDOSEYEV, B.I.; YANOVSKIY, D.M.

Graft copolymerizarion. Part 6: Fractionation of the products from the graft polymerization of vinyl choloride with the butyl methacrylate-methacrylic acid copolymer. Vysokom. soed. 2 no.8:1227-1233 Ag '60. (MIRA 13:9)
(Ethylene) (Methacrylic acid)

86293

S/190/60/002/008/004/017
B004/B054

11.2210 also 2209

AUTHORS: Berlin, A. A., Kronman, A. G., Yanovskiy, D. M., Kargin, V. A.

TITLE: Modification of Polyvinyl Chloride by Rubbers

PERIODICAL: Vysokomolekulyarnyye soyedineniya, 1960, Vol. 2, No. 8, pp. 1188-1192

TEXT: The authors attempted to make graft copolymers from vinyl chloride and rubbers. In contrast to the unsuccessful copolymerization with the aid of latex reported on in Ref. 2, they used coarsely disperse rubber emulsions. Photogelatins, Sulfanole, or polyvinyl alcohol were used as emulsifiers. Copolymerization was conducted by two methods: 1) Swelling or dissolving of the rubber in vinyl chloride at 40-70°C, and subsequent polymerization in an autoclave after adding ammonium persulfate as initiator; 2) rolling of the rubber with ammonium-persulfate powder at room temperature, and subsequent copolymerization with vinyl chloride in an autoclave at 60-70°C. Viniplast was made from the reaction products by adding calcium stearate, lead monoxide, Neozone D, and transformer oil, kneading at 155-170°C, and pressing. The resulting products showed worse physical

Card 1/2

86293

Modification of Polyvinyl Chloride by Rubbers S/190/60/002/008/004/017
B004/B054

properties than pure polyvinyl chloride. On the other hand, a joint plastification of polyvinyl chloride (PVC) of the type ПФ-4 (PF-4) with НК (NK) natural rubber, СКБ(SKB) butadiene rubber, СКИ (SKI) isoprene rubber, СКН-26 (SKN-26) butadiene-nitrile rubber, and chloroprene rubber (nairit), led to the following results:

PVC combined with:	Content of rubber, %	toughness kg·cm/cm^2	tensile strength kg/cm^2	relative elongation, %
(without rubber)	0	8.6	550	82
natural rubber	10	9.7	354	4.4
butadiene rubber	10	6.7	350	5.8
isoprene rubber	10	3.7	357	9.7
nairit	10	16.5	437	81.5
butadiene-nitrile rubber	10	34.6	551	100

Rubbers with marked polarity (nairit, SKN-26) showed double to fourfold toughness. Hydrogen bonds are likely to form between the polar rubber and PVC. There are 2 figures, 2 tables, and 7 references: 1 Soviet, 4 US, 1 Belgian, and 1 French.

SUBMITTED: March 21, 1960
Card 2/2

86327

S/190/60/002/012/014/019
B017/B078

15.8102 2209

AUTHORS: Berlin, A. A., Kronman, A. G., Yanovskiy, D. M., Kargin, V.A.

TITLE: New Method of Obtaining Graft Copolymers

PERIODICAL: Vysokomolekulyarnyye soyedineniya, 1960, Vol. 2, No. 12, pp. 1839 - 1844

TEXT: A new method of obtaining graft copolymers by interaction between the polymers is suggested by the authors. This method permits to modify halogen-containing polymers with polymers having nitrogen-containing heterocycles. A case in point for such a reaction is the modification of PVC with methylvinylpyridine rubber under the formation of graft copolymers which are salts of quaternary polymer bases. Vinyl plastics obtained from such polymers have an impact strength ten times as high as that prepared solely from polyvinylchloride. Fig.1 illustrates the temperature dependence of some thermomechanical properties of some polyvinyl plastics. The two-stage formation of trimers is explained. Fig.2 illustrates the influence of the rubber content on the properties of polyvinyl plastics.

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86327

New Method of Obtaining Graft Copolymers S/190/60/002/012/014/019
B017/B078

Fig.3 shows the vitrification temperature of polyvinyl plastics as a function of the admixtures. It is demonstrated that the thermal stability of polyvinyl plastics is not impaired by a methylvinylpyridine rubber content up to 25%. The method suggested here may be applied to vulcanize various halogen-containing polymers with methylvinylpyridine rubber. There are 3 figures and 13 references: 9 Soviet and 4 US.

SUBMITTED: May 24, 1960

Card 2/2

87642
S/191/60/000/012/001/016
B020/B066

11.2210 also 2209,

AUTHORS: Berlin, A. A., Kronman, A. G., Yanovskiy, D. M., Kargin, V.A.

TITLE: Impact-resistant Polyvinyl Chloride

PERIODICAL: Plasticheskiye massy, 1960, No. 12, pp. 2 - 3

TEXT: Heat resistance and impact of PVC are comparatively low which considerably confines its range of applicability in spite of its other good properties. It is possible to increase the impact strength of PVC by synthesizing vinyl chloride polymers grafted with various rubbers, by means of a chain transfer reaction. The mechanical properties of Viniplasts obtained by this method are, however, no better than those of Viniplast made of PVC. The present paper investigates the physical and thermomechanical properties of Viniplast obtained from compositions consisting of PVC coplasticized with a polar synthetic rubber (PSR). Owing to interaction of functional groups of PVC with the rubber, interlaced structures of grafted copolymers are formed. PVC was mixed with stabilizers (litharge, calcium stearate) which were hot-rolled along with the adequate amount of PSR. Plates were cut from thin foils of the rolled

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S/191/60/000/012/001/016
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material, and a stack of them was hot-pressed. In the test of Viniplast containing 10% PSR of different types, its physical and mechanical properties ranged within the following limits: specific impact strength from 57.2 to 84.8 kg·cm/cm^2 (8.6 for initial PVC); maximum tensile strength from 397 to 530 kg·cm^2 (550 for PVC); vitrification point between 76 and 80°C (75°C for PVC). The addition of 10% PSR to the Viniplast, thus, increases the specific impact strength up to the 6 to 10 fold, whereas the tensile strength is somewhat reduced, and the vitrification point is maintained. The dependence of the specific impact strength, tensile strength and relative elongation on the rubber content in Viniplast was investigated (Figs.1-3). The optimum ratio of PVC:PSR for obtaining Viniplast with high specific impact strength is 90:10 (Fig.1). The introduction of 2.5% rubber increases the impact strength of Viniplast to the threefold. At a rubber content of 15 - 50%, Viniplast samples were not destroyed in the impact test owing to their high elasticity. With increasing rubber content, tensile strength and relative elongation of the material (Figs.2,3) decrease, and the surface of Viniplast becomes uneven and rough, beginning from a rubber addition of 25 - 30%. The temperature dependence of the specific impact strength

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of impact-resistant Viniplast was studied in a range of from -60° to +60°C, and it was found that a Viniplast with 5 and 10% PSR exceeds a Viniplast from PVC even at a temperature below 0°C. The specific properties of impact-resistant Viniplast become particularly manifest at room temperature. The absolute value of the specific impact strength could only be determined at temperatures below zero. Table 1 gives comparative data of this factor obtained on compositions with 90% PVC and 10% PSR, and on PVC samples. The principal physical and thermomechanical properties of impact-resistant Viniplast, as well as of PVC-Viniplast, are presented in Table 2. There are 4 figures, 2 tables, and 1 Soviet reference.

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30909
S/190/61/003/012/003/012
B101/B110

15.8500 2209

AUTHORS: Popova, Z. V., Yanovskiy, D. M.

TITLE: Effect of some stabilizers on the thermomechanical properties of polyvinyl chloride

PERIODICAL: Vysokomolekulyarnyye soyedineniya, v. 3, no. 12, 1961, 1782 - 1786

TEXT: The relationship between the ability of various stabilizers of inhibiting dehydrochlorination of polyvinyl chloride (PVC) and the thermomechanical properties of PVC was studied. PVC type ПФ spetsial'naya (PF special) was used. Stearates of Pb, Ba, Ca, and Cd served as stabilizers (acceptors of HCl), (0.00025 moles per 10 g of PVC). Derivatives of phenols, aromatic ketones, and similar compounds (0.00025 moles per 10 g of PVC) being nonacceptors of hydrogen chloride served as antioxidants. Thermal treatment was carried out at 175°C in the air current (0.2 liters/min), in the nitrogen current (0.2 liters/min), or in evacuated ampoules ($1 \cdot 10^{-3}$ mm Hg). Heating was carried out for 15 - 180 min. The dehydrochlorination rate was determined by a method described

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earlier (Ref. 2: Zh. prikl. khimii, 34, 1324, 1961; Ref. 3: Vysokomolek. soyed., 2, 210, 1960). The deformation curves were plotted after previous heating of PVC at 130 - 140°C and 300 atm for 15 minutes. The temperature range for the plotting of curves was 60 - 220°C, the load 740 g/cm^2. It was found: (1) Ba-, Ca-, and Cd stearates do not retard dehydrochlorination and do not prevent the loss of fluidity; Pb stearate inhibits dehydrochlorination and retards the loss of fluidity; (2) the effects of antioxidants are given in a table; (3) the point of time at which fluidity is lost under conditions of thermal treatment depends on the O_2 content of the gaseous phase, furthermore on the intensity of the removal of HCl split off from the polymer; (4) fluidity was lost in O_2 atmosphere after 60 min; in N_2 atmosphere after 180 min; in the ampoules already after 15 min. With intense removal of HCl by evacuation in N_2 atmosphere, PVC remains meltable even after 180°C; (5) if fluidity is preserved, transition into the viscous flow state occurs, possibly due to decrease of MW of PVC; (6) loss of fluidity due to cross linking was also observed in PVC whose MW was lower than that of the initial PVC. Consequently, the initial

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structure of PVC is not preserved. The effects observed were defined as processes of destruction and structuration during heating, and as after-effect of free radicals remaining in PVC after heating. Mentioned are V. A. Kargin, M. N. Shteding (Khim. prom-st', no. 3, 1955, 137). Some of the antioxidants were made available by Ye. N. Zil'berman and N. A. Rybakova. There are 4 figures, 1 table, and 4 Soviet references.

SUBMITTED: January 2, 1961

Table 1. Effect of antioxidants on the rate of dehydrochlorination of PVC at 175°C. (The rate of dehydrochlorination of nonstabilized PVC was equated to 100%).

Legend: (a) current no.; (b) antioxidant; (c) relative rate of dehydrochlorination of PVC, in the presence and absence of antioxidant, %; antioxidants are (according to current no. of table): I = 2,2',4,4'-tetrahydroxypimelophenone; II = 2,2',4,4'-tetrahydroxyazelaophenone; III = 2,2',4,4'-tetrahydroxysebacophenone; IV = 2,4-dihydroxy-3'-nitrobenzophenone; V = benzophenone; VI = 4-phenylbenzophenone; VII = 2,4-dihydroxy acetophenone; VIII = α,α'-bis-(2,4-dihydroxybenzoyl)-p-xylylene; IX = 2,4-

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dihydroxy-4'-chlorobenzophenone; X = acetophenone; XI = Diphenyl; XII = 1,1-bis-(4-hydroxyphenyl)-cyclohexane; XIII = ethyl resorcinol; XIV = 2,2',4,4'-tetrahydroxydiphenyldecane.

Table

(a) № п.п.	(b) Антиоксидант	(c) Относительная скорость дегидрохлорирования ПВХ в присутствии и в отсутствие антиоксиданта, %
I	2,2',4,4'-Тетраоксидиметилофенон	122
II	2,2',4,4'-Тетраоксиазелаофенон	112
III	2,2',4,4'-Тетраоксисебацофенон	123
IV	2,4-Диокси-3'-нитробензофенон	110
V	Бензофенон	100
VI	4-Фенилбензофенон	100
VII	2,4-Диоксиацетофенон	100
VIII	α,α'-*бис*-(2,4-Диоксибензоил)-*п*-ксилилен	100
IX	2,4-Диокси-4'-хлорбензофенон	100
X	Ацетофенон	95
XI	Дифенил	95
XII	1,1-*бис*-(4-Оксифенил)-циклогексан	90
XIII	Этилрезорцин	75
XIV	2,2',4,4'-Тетраоксидифенилдекан	55

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15-8530 also 2209

26866
S/080/61/034/004/007/012
A057/A129

AUTHORS: Popova, Z. V.; Yanovskiy, D. M.; Zil'berman, Ye. N.; Rybakova, N.A. Ganina, V. I.

TITLE: Effect of some phenols on thermal and photo-decomposition of polyvinylchloride

PERIODICAL: Zhurnal prikladnoy khimii, v. 34, no. 4, 1961, 874 - 881

TEXT: The correlation between the structure of the compound and the effect on the rate of thermal and photo-decomposition of polyvinylchloride (PVC) for some derivatives of 2-oxysubstituted and non-substituted (in the ortho position benzophenones and acetophenones, alkyl- and alkylene resorcines, as well as some analogous compounds was investigated. It was found that the stabilizing effect is not only due to the absorption ability of ultraviolet light ("filter effect"), but also to the ability to inhibit chain reactions in thermal and photo-decomposition of PVC. The "filter effect is better expressed in compounds containing molecules in which an interaction occurs between carbonyl and hydroxyl groups, resulting in formation of a hydrogen bond. The ability for inhibition of decomposition of PVC by chain reactions is prevalent in compounds containing an

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easily mobile hydrogen atom in the hydroxyl group. In prior papers (Ref. 4: Vysokomol. soyed., 2,2,210, 1960; and Ref. 5: Doklady Mosk. Mezhdunarod. Simposiuma po makromol. khim. (Reports of the International Symposium on Macromol. Chem. Moscow), III, 372, 1960) the present authors demonstrated that ultraviolet light-absorbing stabilizers (among these benzophenone derivatives) also diminish thermal decomposition of PVC. The ultraviolet spectra of the substances investigated in the present work were taken with an СФ-4 (SF-4) spectrophotometer. Depending on the absorption ability concentrations from 0.005 to 0.074 g/l of stabilizers were used. PVC samples of the "ПФ-spetsial'naya" (PF-special) resin type with 0.00025 mole stabilizer per 10 g PVC were investigated. The inhibiting effect on thermal decomposition of PVC was estimated comparing the dehydrogenation rate by heating stabilized and non-stabilized PVC (Ref. 16: ZhPKh, 33, 1, 186, 1960). The photostabilizing effect was determined by the decrease in thermal stability and increase in HCl evolution rate of a stabilized and non-stabilized sample after irradiation by a ПРК-2 (PRK-2) ultra-violet bulb (Ref. 16). If v_1 and v_2 are the mean integral HCl evolution rates until and after irradiation (175°C, 180 minutes in air stream) of the non-stabilized PVC sample, and v_3 and v_4 of the stabilized sample, then the ratio v_3/v_1 or v_4/v_2, respectively, characterize the effect of the stabilizer prior to and after irradiation. On the other hand the ratios v_2/v_1 and

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v_4/v_3 characterize the increase in the dehydrochlorination rate for the non-stabilized and stabilized PVC. The stabilizer has a "filter effect" if $v_2/v_1 > v_4/v_3$, while $v_4/v_3 > v_2/v_1$ indicates that the stabilizer is a photosensitizer. The obtained results demonstrate on a table that the strongest inhibitors for the thermal decomposition of PVC are 2, 4, 6- trioxybenzophenone (III), 1,10-di-(2,4-dioxyphenyl)-decane (XIX) and ethylresorcine (XVIII). Less effect is obtained with 2,4-dioxybenzophenone (I), 2-oxy-4 methoxybenzophenone (II), 2,2'-dioxy-4,4'-dimethoxybenzophenone (VI), acetophenone (XVI). No inhibiting effect was obtained with 2,4-dioxy-4'-chlorobenzophenone (IV), 2,4-dioxy-3'-nitrobenzophenone (V), 2,4-dioxyacetophenone (VII), 2,2', 4,4'-tetraoxyderivatives of adipophenone (IX), or pimelophenone (X), of azelaophenone (XI), of sebacophenone (XII), 4-phenylbenzophenone (XV), and benzophenone (XIV). Apparently the inhibiting effect is in relation to the mobility of the hydrogen atom in the hydroxyl group. Thus the compounds XIV, XV, XVI and XVII do not have hydroxyl groups and also no inhibiting effect on thermal decomposition of PVC. In the compounds I, II, IV, V, VII, IX - XII and α,α'-di(2,4-dioxybenzoyl)-p-xylylene (XIII) cyclization is possible by interaction of the hydroxyl group (being in ortho position) with the carbonyl group. Cyclization diminishes the mobility of the hydrogen atom in the hydroxyl group, thus effecting a decrease in the inhibition effect of these compounds.

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Molecules of XVIII and XIX contain a mobile hydrogen atom which does not react with the carbonyl group. This explains the higher inhibiting effect of these compounds in relation to VII and XII. The high effect of III is caused by the two hydroxyl groups being in ortho position to the carbonyl group thus having a weakend cycle. The greatest "filter effect" is shown by diphenyl (XVII), 2,2', 4,4'-tetraoxy-derivatives of adipophenone (IX), of pimelophenone (X), (XI), (XII) and also (V). No effect was shown by (III), (XVI) and (XVIII). Stabilizers with a strong "filter effect" have an intensive light absorption in the range of 2,200 - 3,300 Å. There are 2 tables and 17 references: 8 Soviet-bloc and 9 non-Soviet-bloc.

SUBMITTED: July 9, 1960

Card 4/4

2400

S/080/61/034/006/012/020
D247/D305

158050

AUTHORS: Popova, Z.V., and Yanovskiy, D.M.

TITLE: The synergic effect of stearates of certain metals in the stabilization of polyvinylchloride

PERIODICAL: Zhurnal prikladnoy khimii, v. 34, no. 6, 1961, 1324 - 1329

TEXT: Reference is made to an earlier paper by D.M. Yanovskiy et al (Ref. 4: ZhPKh, 1959, vol. 32, No. 7, p. 1575) which studied the stabilizing effect of Pb, Ba, Ca, Cd and Zn stearates and their synergic effect in thermal breakdown of chlorinated polymers. The present paper studies the effect of stearates and mixtures of them on the rate of dehydrochlorination of PVC during thermal breakdown and the relation between synergic effect and ability to link with HCl molecules. The same metal stearates were used as in (Ref. 3: B. Henderson, Can. Plast., november, 66, 1957). Thermal breakdown of PVC was studied in an air current at 175°C, using PVC resin

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The synergic effect of ...

type "PF-special", of which the absolute viscosity in 1 % solution in dichlorethane was 2.15 poises. The promotion effect of Cd stearate decreases in proportion to its concentration increase but, with the addition of 10 % of the salt the rate of PVC breakdown remains higher than that of the non-stabilized polymer, this effect being ascribed to the dual character of the Cd stearate on the breakdown process in the presence of oxygen. The rates of acceptance of HCl during thermal breakdown of PVC with stearates and mixtures thereof were determined. For all mixtures examined - except 5 % Cd stearate with 5 % Pb stearate - the acceptor power is higher than the additive value. The synergic effect is thus due to the increased acceptor power of mixtures as compared with the individual stearates and is not due to increase of inhibiting effect on decomposition of the polymer. There are 6 figures and 6 references: 3 Soviet-bloc and 3 non-Soviet-bloc. The references to the English-language publications read as follows: L.N. Wartman, Ind. Eng. Chem., 1955, vol. 47, no. 5, p. 1013; B. Henderson, Can. Plast., 1957, November, p. 66.

SUBMITTED: April 18, 1960

Card 2/2

35265

S/064/62/000/002/003/008
B101/B144

15.9000

AUTHORS: Berlin, A. A., Kronman, A. G., Yanovskiy, D. M., Kargin, V. A.

TITLE: Impact resistant materials on the basis of graft copolymers of polyvinyl-chloride with elastomers

PERIODICAL: Khimicheskaya promyshlennost', no. 2, 1962, 20-24

TEXT: A survey of publications concerning an increase of the impact strength of polyvinyl-chloride (PVC) by copolymerization with methyl-vinyl pyridine rubbers and nitrile rubbers is given and data from the authors own studies are repeated. In addition, the Huggins constant K' for copolymers of PVC with CK MBT-15 (SK MVP-15), CKH-18 (SKN-18), and CKH-26 (SKN-26), calculated from the intrinsic viscosity is mentioned. The intrinsic viscosity was determined in cyclohexanone.

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Solution investigated	$[\eta]$	K'
SK MVP-15	0.8	0.346
PVC	0.835	0.433
Reaction product	0.72	0.617
Mechanical mixture	0.8	0.356
SKN-18	1.78	0.656
PVC	1.01	0.248
Reaction product	0.915	0.397
Mechanical mixture	1.14	0.272
SKN-26	2.38	0.511
PVC	1.01	0.248
Reaction product	0.95	0.644
Mechanical mixture	1.085	0.491

The lower intrinsic viscosity of the copolymers is explained by their inferior solubility. The high K' is caused by a branched structure. When copolymerizing PVC with nitrile rubber or methyl-vinyl pyridine rubber, reaction between the Cl of PVC and the N of nitrile and pyridine,

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respectively, sets in under formation of tridimensional structures. There are 4 figures, 3 tables, and 19 references: 9 Soviet and 10 non-Soviet. The four most recent references to English-language publications read as follows: L. C. Bateman, Ind. Eng. Chem., no. 4, 704 (1957); G. Bloomfield, P. Swift, J. Appl. Chem., no. 11, 609 (1955); J. E. Gordon, C. C. Turrell, J. Org. Chem., 24, 269 (1958); S. E. Bolam, Austral. Plastics, 10, no. 107, 18 (1954).

X

Card 3/3

BERLIN, A.A.; KRONMAN, A.G.; YANOVSKIY, D.M.; KARGIN, V.A.

Materials of high resilience based on graft copolymers of poly(vinyl chloride) with elastomers. Khim.prom. no.2:96-100 F '62. (MIRA 15:2)

(Vinyl compound polymers)
(Elastomers)

BUBIS, L.D.; KARPOV, V.L.; MALINSKIY, Yu.M.; YANOVSKIY, D.M.

Polymerization of vinyl chloride under the effect of gamma rays.
Plast.massy no.4:3-6 '62. (MIRA 15:4)
(Vinyl compound polymers) (Gamma rays)

S/191/62/000/004/002/017
B110/B138

15.8050

AUTHORS: Bubis, L. D., Karpov, V. L., Malinskiy, Yu. M., Yanovskiy, D. M.

TITLE: Polymerization of vinyl chloride under the action of γ-rays

PERIODICAL: Plasticheskiye massy, no. 4, 1962, 3-6

TEXT: Industrial PVC with 0.5 % impurities (vinylidene chloride, chloro ethyl, methanol, acetylene, β-chloro propylene, methyl acetylene) was polymerized by means of γ-rays (Co^{60}, 18,000 g-equiv Ra). The kinetics showed it to be a case of radical polymerization. There was a long induction period at -78, -20, 0, and 20°C and P = 15 rad/sec, due to removal of primary radicals which reacted with the impurities. The total activation energy was 4.7 kcal/mole calculated from the temperature dependence of rate of polymerization between 10 and 20 % conversion with constant radiation dose. This is quite close to the figures obtained for the radiation polymerization of methyl methacrylate (5.15 kcal/mole) and styrene (6.45 kcal/mole). It is lower than with initiated polymerization since under irradiation the radical formation is independent of temperature.

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The radiation dependence of the rate of polymerization is: $v = AP^n$, where A = const for a given temperature, n = 0.56 ± 0.07.. This indicates polymerization by the bimolecular mechanism. If the yield for 100 ev absorbed energy is calculated from the corresponding rates, $G = B/P^n$, where G = yield, B = const for a given temperature, m = 0.47 ± 0.04. Thus, an increased radiation dose accelerates polymerization but reduces the efficiency of the process. At -20 and 20°C and 1-15 rad/sec, the characteristic viscosity decreases with increasing dose. This raises the initiation rate and the concentration of active centers, which causes a reduction in polymerization. Viscosity increases with a temperature drop from 20 to -20°C. A further drop, however, lowers it. The temperature coefficient of the degree of polymerization is positive. This was observed in PVC polymerization between -78 and 20°C. The temperature dependence of the characteristic viscosity was anomalous between -20 and 20°C. This is due to increased probability of the chain being broken due to transfer via monomer and impurities, which may lead to a change of the molecular weight. Characteristic viscosity and decomposition temperature increased up to ~20 % conversion, falling with further increase. The initial decrease of characteristic viscosity and thermal stability is due to impurities which